Economics at the FTC: Drug and PBM Mergers and Drip Pricing

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Abstract:
Economists at the Federal Trade Commission (FTC) pursue the agency's competition and consumer protection missions. In this year's essay, in antitrust, we discuss two recent mergers that involved Rx drugs: First, we describe key elements of the inquiry into the Express Scripts (ESI)/Medco transaction in the pharmacy benefit management (PBM) industry. Next, we analyze a merger that involved drugs that are used to treat patent ductus arteriosus: a condition that affects premature babies. On the consumer protection side, we discuss a pricing strategy – drip pricing – that involves the release of price information about a multi-part product over time as the consumer goes through the purchase process.

Keywords: antitrust, consumer protection, drip pricing, FTC, pharmaceutical mergers, PBMs

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1 Introduction

The Federal Trade Commission's (FTC) Bureau of Economics (BE) includes about 80 Ph.D.-level economists, a small group of accountants, and 25 other staff (including research analysts). Its work supports the FTC's competition (antitrust) and consumer protection missions. Most of the Bureau's efforts assist the Commission's investigations and enforcement, but FTC economists also help promote competition-oriented policies domestically at state and federal levels, and contribute to global adoption of modern, economically-oriented competition policies.

To keep our knowledge base and skills up-to-date, we undertake various research-related activities, including an annual conference on microeconomic issues that are relevant to our two missions. In November 2011 our fourth annual conference was conducted jointly with Northwestern University's Searle Center on Law, Regulation, and Economic Growth.[1] Topics included consumer credit and decision-making, mortgages, antitrust issues, advertising markets, and personalized medicine. Our fifth conference, slated for November 2012, will solicit contributions on a wide range of microeconomic subjects that impact consumer welfare.

2 Mergers

Merger enforcement is the bulk of our antitrust work. MergerStat reported that general merger and acquisition (M&A) activity involving US firms was about $0.87 TR in 2011, compared with

[1] Northwestern University's Searle Center website can be found at http://www.law.northwestern.edu/searlecenter/

$1.2 TR in the pre-crisis year of 2007.[2] About 1450 merger filings occurred in 2011, and the FTC challenged all or some aspect of 17 transactions.[3]

We examine mergers in a large number of different industries, and one of the most active recently has been drugs. We describe our analysis of two recent mergers involving actors in the pharmaceutical and health care area.

2.1 The Express Scripts (ESI) / Medco PBM Transaction

During the past year, the FTC concluded an extensive investigation of the combination of two of the three largest pharmacy benefit managers (PBMs): Medco Health Solutions (Medco) and Express Scripts, Inc. (ESI). Based on the evidence that was gathered in this investigation, the Commission concluded that the $29.1 billion transaction was unlikely to harm competition, despite a significant increase in market concentration. Based on these findings, the FTC allowed the merger to consummate unconditionally.[4]

PBMs administer the prescription pharmaceutical portion of a healthcare benefit, which is typically purchased by a "plan sponsor" (e.g., a health insurer or an employer directly) for a group of beneficiaries. PBMs provide a bundle of services that are related to the administration of pharmaceutical benefits. These services include: claims adjudication (the point-of-sale processing of a pharmaceutical claim); formulary design; management and negotiation of branded drug rebates; management and negotiation of networks of retail pharmacies; reviews of

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[2] MergerStat Review, 2012, p. 10. The data represent the dollar value of mergers, acquisitions, and divestitures involving US firms if at least 10% of the equity of a firm is transferred and a value is reported.

[3] FTC & DOJ Hart-Scott-Rodino Annual Report, Fiscal 2011 (pp. 1-2). Retrieved from http://www.ftc.gov/os/2012/06/2011hsrreport.pdf (6-14-2012).

[4] Commissioner Brill dissented. Both the Commission's closing statement and Commissioner Brill's dissent are available from the press release at http://www.ftc.gov/opa/2012/04/medco.shtm.

drug utilization; and the operation of specialty and home-delivery (i.e., "mail-order") pharmacies.

Despite the presence of numerous PBMs, the industry is concentrated. At the time of its consummation, the combined firm accounted for more than 40% of prescription dollars administered by PBMs.

2.1.1 The Theory and Competitive Analysis

Competition for "PBM services" takes place within a bidding process that is initiated by a plan sponsor. Customers issue a "request for proposal" ("RFP") that describes the required services and solicits pricing proposals that consist of several component prices. The RFP process is often designed and administered by a third-party consultant. Typically, pricing is the most significant difference between RFP responses, where the prices of competing PBMs are compared on the basis of the total predicted pharmaceutical expenditures under each bid.[5] In addition, the cost of switching from the incumbent PBM is usually incorporated as part of the price comparison. Thus, competition occurs in an auction setting, and incumbency status and cost differences across PBMs are likely the most important determinants of competitive outcomes in the PBM market.

Taking account of these institutional features of PBM competition, the FTC investigated the likely effect of the merger, focusing in particular on whether both of the merging parties had uniquely low costs for servicing any specific group of customers.[6] If they did, each would represent a substantial competitive constraint on the other for that group of customers, implying

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[5] There are some service differences across PBMs, but these differences rarely cause a plan sponsor to choose one PBM over another.

[6] The FTC staff also investigated monopsony concerns and concerns that were related to PBM ownership of and relationship with pharmacies. As discussed in the Commission closing statement, we found harm from these concerns to be unlikely.

that the merger could have resulted in higher prices for those particular customers. The FTC evaluated the merger under this framework using two sets of empirical analyses. The first analysis used bidding data from RFPs to measure directly the importance of competition between the parties. The second analysis compared the main components of PBMs' costs to understand directly how the parties' costs compared to other PBMs.

The bid-data analysis examined information that was obtained from the parties and from third-party consultants.[7] The primary method for measuring the importance of the competition between the parties was to measure "conditional loss" in the parties' bid data, which measures the fraction of incumbent business that is lost to each of the other PBMs, conditional on the incumbent losing the RFP. Conditional loss is a simple and intuitive measure of substitution (similar to diversion ratios), and it also approximately corresponds to the frequency of winner/second place pairings in auctions, which is a relevant competition metric that is implied by auction theory. Due, in part, to the costs that are associated with switching PBMs, the incumbent is likely to be the constraining "second place" bidder when it loses an account (e.g., the incumbent is usually invited to be a "finalist" in multi-round auctions).[8] Conditional loss relies only on the identity of the winner when one of the parties lost a customer, which the parties track more easily than the actual bid terms, the rankings of losing competitors, or even the identities of losing competitors. Conditional loss was calculated for several segments of customers, including large employers, and large employers with specific service requirements

[7] The parties' data contained the universe of contests in which they participated. Third party consultant data provided a small subset of bids but was more detailed than the parties' data.

[8]This correspondence was tested directly with the more detailed consultant data (even with this data it was difficult to determine the second-place bidder because the bids are so complicated). While the correspondence of new winner/losing incumbent and winner/second place was certainly not perfect, they were closely related.

(e.g., mail-order service requirements).[9] In addition, using the consultant data, the frequency of winner/second place pairings was measured as a robustness check.

The conditional loss analysis demonstrated that competition from non-merging rivals was substantial, relative to the pre-merger competition between ESI and Medco, and sufficient to prevent a substantial loss of competition from the acquisition. This analysis also showed that market shares are not an accurate indicator of the likely effects of the merger. Medco disproportionately lost to CVS/Caremark (in particular in segments that considered larger customers), and smaller PBMs competed just as closely with Medco as did ESI. ESI, on the other hand, lost business more uniformly to all other PBMs, including Medco. However, Medco was never the most significant competitor to ESI in any customer segment, and smaller PBMs were often at least as significant competitors as Medco.

The direct comparisons of PBM costs explain and corroborate the results of the bidding data analysis. This analysis considered four specific areas of costs: (1) reimbursement rates to pharmacies; (2) rebates negotiated with branded drug manufacturers; (3) mail-order fulfillment costs; and (4) mail-order drug procurement costs. Two approaches were used to analyze costs. Differences between PBMs for each of these cost components were evaluated with cross-sectional comparisons, controlling for various factors (e.g., plan design for rebates). The second approach exploits previous merger activity in the industry to test whether the increase in scale from the merger was associated with a decrease in costs using a difference-in-differences econometric framework. Neither approach revealed significant incremental scale economies in the negotiation of rebates or pharmacy reimbursement. Although the analysis did reveal that larger firms had lower mail-order costs (both fulfillment and procurement) than did smaller firms, the minimum size necessary to achieve those lower costs was no longer unique to the parties and CVS/Caremark. Moreover, some of the smaller PBMs had recently made investments

[9] The analysis also applied different weighting structures to RFPs (e.g., weighing each lost account equally and weighting accounts proportional to their size).

in their mail-order operations that allowed them to achieve costs that were competitive with the larger PBMs.

Both the analysis of bidding data and the analysis of the cost data showed that other smaller PBMs effectively compete today and are in a strong position to respond to anticompetitive behaviors if the parties were to attempt them post-merger. Based on this evidence, the FTC concluded that a substantial anticompetitive effect was unlikely.

2.2 FTC v. Lundbeck and Drug Therapies for PDA

In 2005, Lundbeck[10] acquired Indocin IV, then the only drug treatment for patent ductus arteriosus (PDA), a serious, but treatable, congenital heart defect that affects some premature babies. In 2006, Abbott was about to introduce NeoProfen, an alternative drug treatment for PDA, but Lundbeck acquired the rights to NeoProfen. The FTC challenged this 2006 acquisition, arguing that Indocin IV and Neoprofen were the only non-surgical therapies available for PDA. The case was litigated in federal district court.

In 2009 the district court held that, even if they had been owned separately, the two drugs would not have competed enough to be in the same antitrust market: cross-elasticity of demand was "very low."[11] That conclusion relied on two strands of testimony: First, eight doctors (specifically, neonatologists) testified that in deciding what to prescribe, they would not consider prices, or at least not modest price differences. Second, the FTC's and Lundbeck's experts disagreed about whether hospitals would have been able to use their formularies to play independent sellers of the two drugs off against one another. The court adopted Lundbeck's expert's view that competition for inclusion on a hospital formulary could not be used to obtain

[10] As a formal matter, Indocin was acquired by Ovation, which later was acquired by Lundbeck; the economic issues are most simply described as in the text. Public documents about the Lundbeck case can be found at http://www.ftc.gov/os/caselist/0810156/index.shtm

[11] *FTC v. Lundbeck, Inc.*, 2009 WL 2215006 (2009). The FTC appealed, but the court of appeals upheld the finding, based on the standard of review. See *FTC v. Lundbeck, Inc.*, 650 F.3d 1236 (1211).

price concessions, although the court did not elaborate on why formulary competition would not work in this market.

Although the eight physicians testified that they would not switch PDA drugs for a small price increase, in general physicians themselves seldom face direct fiscal consequences of choosing between differently priced treatments, so this is not where one would usually look for cross-elasticity based on price.[12] Rather, for hospital-based drugs, hospital pharmacy and therapeutics committees often pit suppliers of (imperfectly) substitutable drugs against one another for inclusion on the hospital "formulary." Doctors may still occasionally prescribe a drug that is omitted from the hospital's formulary, but they are less likely to do so. Drug manufacturers have an incentive to be sufficiently cheaper than rivals to exclude rivals from the formulary.[13] And hospitals have an incentive to steer doctors towards cheaper drugs when medically appropriate. In this market, hospitals did adopt procedures to steer usage towards one or the other drug, as more than half of all hospitals carried only Indocin or only NeoProfen.

The court did not explain its rationale for why the formulary process could not obtain price concessions in this market; but, perhaps, the court believed that hospitals could not credibly threaten to steer physicians, based on the physicians' testimonies that they had strong preferences for these drugs. This is somewhat difficult to reconcile with company documents that described some accounts as "indifferent" between the two drugs.[14] But even if physicians have strong

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[12] The concurring opinion in the appeals' court decision agreed noting that, "In an antitrust case, it seems odd to define a product market based upon the actions of actors who eschew rational economic considerations." http://www.ftc.gov/os/caselist/0810156/110919lundbeckopinion.pdf

[13] Manufacturers will also often offer discounts in exchange for increasing share, even if the rival is not completely excluded. For example, a hospital formulary could put Indocin on a preferred tier and recommend that doctors use Indocin when either drug will work for a patient, but allow doctors to use NeoProfen when medically appropriate.

[14] Finding of Fact 85 in the judge's decision, which described red, yellow, and green accounts described yellow accounts as "in the process of determining which drug to use or… indifferent." http://www.ftc.gov/os/caselist/0810156/110919lundbeckfindings.pdf

preferences today and hospitals have difficulty steering dispensing practices, the court failed to recognize the uncertainty that occurs when a new drug is launched. When a new drug is being launched, manufacturers lack perfect information about how accepted the drug will be by the market and how willing hospitals will be to substitute between the two drugs. And this uncertainty provides hospitals with an opportunity to play pharmaceutical manufacturers off against one another.[15] Fundamentally, by removing an independent alternative from the market, Lundbeck denied hospitals the opportunity to take advantage of this uncertainty.

In our view, the testimony of neonatologists is not inconsistent with hospitals using the formulary process to obtain price concessions. Similarly, the testimony of the neonatologists should not be taken to imply that cross-elasticity was "very low". But, even if cross-elasticity of demand was "very low", that does not eliminate the possibility of harm. Suppose (as the court thought) that Indocin's very high gross margin would have been about the same had Lundbeck owned Indocin and Abbot independently offered NeoProfen. That choice of margin by Lundbeck would be rational only if demand for Indocin had low *own*-elasticity: few Indocin uses would have been deterred by a price increase. A fortiori, few would have switched from Indocin to NeoProfen: low *cross*-elasticity. The court may have assumed that since *zero* cross-elasticity would imply no unilateral effect of the merger, "very low" cross-elasticity would imply very little unilateral effect. But even "very low" cross-elasticity, in absolute numerical terms, suffices to make a merger anticompetitive when there is little demand elasticity overall.

The unilateral effect of mergers turns on margins and diversion ratios, not on cross-elasticities in isolation: see for instance Shapiro (1996, especially p. 26). When own-elasticity is very low, a very low cross-elasticity is entirely consistent with a moderate or high diversion ratio—the ratio of cross-elasticity to own-elasticity. As Shapiro shows, such a diversion ratio, combined with high margins (consistent with low own-elasticity), strongly suggests a big effect from the merger. The profit-maximizing price increase will depend on the shape of demand, but the

[15] At the time that NeoProfen was launched, hospitals that used Indocin and wanted to stick to Indocin could have threatened to move volume to NeoProfen if the owner of Indocin did not provide a price concession.

simple example of linear demand with symmetric margins, symmetric diversions, and equal pre-merger prices and volumes, makes the basic point:[16]

$$\%\Delta P = \frac{MD}{2(1-D)} \quad where \quad M = \frac{(p-c)}{p} \quad and \quad D_{ij} = \frac{e_{ji}}{e_{ii}}$$ [17]

The post-merger price increase will be large if the pre-merger margin M is large and/or if the diversion ratio D is large. If D is substantial, it is (almost) inconsistent with economics to believe that high margins, observed post-merger, would have been about the same if the products had competed.[18]

Perhaps unsurprisingly, the trial testimony of the market participants did not directly focus on the diversion ratios; but recall that these products were the only two drugs for treating PDA. The record suggests that the non-drug alternative treatments were surgery—dangerous and significantly more costly, according to record evidence—and "watchful waiting;" none of the medical experts argued that many hospitals or doctors would be likely to substitute to those treatments in response to drug price changes. We thus do not believe that the diversion ratio was low.[19] And we believe that the evidence is consistent with an anticompetitive effect from this acquisition.

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[16] See Shapiro (1996); the mathematical derivation can be found in many places such as http://faculty.haas.berkeley.edu/shapiro/unilateral.pdf.

[17] Where p is the pre-merger price of either product, c is marginal cost, e_{ji} is the cross elasticity of demand between the two products, and e_{ii} is the own elasticity of demand.

[18] "Almost" because if demand curves are very strongly kinked at the prices that would prevail absent the merger, it is possible that the merger would have little or no effect. But we know of no reason to suspect that here.

[19] There is, however, one plausible explanation for lower diversions based upon "vial-splitting" of Indocin. Because each vial of Indocin contained more product than was needed to treat each patient, some hospitals attempted to control costs by using the same vial to treat multiple patients. The practice of "vial-splitting" took staff time and was

In addition to arguments about cross-elasticity, the court also stressed two facts that were related to the then-impending entry of generic Indocin. First, the generic entrant expected to draw sales from Indocin, and not from NeoProfen. Second, by ceasing to promote Indocin and by pricing it higher than NeoProfen, Lundbeck sought to switch customers to NeoProfen. The court may have thought that these facts would make no sense if Indocin and NeoProfen were substitutes. Of course, that would be true if they were perfect substitutes, but there is no economic tension in believing—in fact, we would naturally expect—that generic Indocin is a far closer substitute for branded Indocin than for NeoProfen, and that the latter two goods are also imperfect substitutes. Thus Lundbeck would naturally want to migrate its Indocin customers to NeoProfen, so that they would be less likely to be lured away by the lower price of the generic Indocin.

3 The Economics of Drip Pricing

Drip pricing is a pricing technique in which firms advertise only part of a product's price and reveal other charges later as the customer goes through the buying process. The additional charges can be mandatory surcharges or fees for optional add-ons. Examples include hotels that quote a low room rate and then add a resort fee, airlines that set a price for basic air fare and charge extra for meals and checked baggage, banks with free checking and high fees for using international ATMs, and rental cars with tourism fees that are added by local governments. While drip pricing is not new to the FTC, its use is increasing and has been the subject of regulatory action by the U.S. Department of Transportation and the Office of Fair Trading (OFT) in the UK.[20]

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not done when Indocin was priced at a low level, but became more common when Indocin was priced at a high level. Thus vial-splitting may have been a source of own-elasticity that did not correspond to cross-elasticity.

[20] See U.S. Department of Transportation, Enhancing Airline Passenger Protections, Docket DOT-OST-2010-0140, Federal Register, Vol. 76, No. 79, April 25, 2011 and the Office of Fair Trading's report, Advertising of Prices: http://www.oft.gov.uk/OFTwork/markets-work/advertising-prices/.

The FTC's Bureau of Economics held a conference on the Economics of Drip Pricing on May 21, 2012.[21] The purpose of the conference was to improve the understanding of the use of drip pricing in the marketplace and to evaluate policy issues. The conference brought together economists and marketing academics to address the following questions: Why do firms engage in drip pricing? Where does drip pricing occur? How does it affect the way that consumers search for products and services? When is drip pricing harmful? Can competition prevent firms from harming consumers through drip pricing? Are there efficiency justifications for the practice? Can consumer experience or firm reputation limit harm from drip pricing? What types of policies would lead to more transparent prices and improved consumer decision making?

Drip pricing bridges consumer protection and antitrust economics. Since the practice can be deceptive, it is in the bailiwick of consumer protection. However, an understanding of its effect on consumers requires models of competition and markets, which are in the domain of antitrust economics. To cover the wide range of topics relevant to drip pricing, the conference hosted speakers with expertise in several areas, including search theory, aftermarkets, behavioral economics, and consumer behavior.

Firms use drip pricing for different reasons, and a variety of factors influence its effect on consumers and firms. One motivation for using drip pricing is to deceive consumers about a product's price by advertising only part of the price. This is what concerns regulators such as the FTC.

However, there are other reasons that firms use drip pricing that are not necessarily harmful and may even be efficient. One common use of drip pricing is to tailor product offerings to heterogeneous consumers. Commonly referred to as a la carte pricing, this practice allows firms to sell a stripped-down version of the product and offer add-ons to consumers who are willing to

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[21] The conference agenda, presentation slides, and transcript are available at the conference website: http://www.ftc.gov/be/workshops/drippricing/index.shtml

pay for them. A la carte pricing can increase demand by providing marginal consumers with a basic product at a lower price than if non-essential features were bundled with the product. For example, some airline passengers want a snack during the flight, but others do not. This meets the definition of drip pricing because the prices of the optional add-ons are not listed with the advertised price of the basic product. A la carte pricing is more complex than purely deceptive drip pricing. Some consumers are initially surprised by the add-on fees, but for products that are frequently purchased, consumers learn when firms use a la carte pricing and check the fee schedules before deciding what to buy.

Partitioned pricing, which has been studied by consumer behavior researchers in marketing, is the practice of separating a product's price into two or more components. Because partitioned pricing is so similar to drip pricing, it may be difficult to distinguish from drip pricing in the marketplace. Consumer behavior studies have shown that partitioned pricing causes consumers systematically to underestimate the total price of the product, even when all of the components are disclosed up-front. Empirically, the effects of deceptive drip pricing and partitioned pricing are the same: For a given total price, both practices increase the demand for a product. However, partitioned pricing need not rely on deception to make consumers believe that the total price is lower than it is.

A variety of factors can affect the extent to which drip pricing is harmful. First, drip pricing may complicate the way consumers search for products. When firms do not advertise their prices, consumers must engage in costly search to learn prices. Diamond (1971) shows that the existence of consumer search costs allows sellers to charge the monopoly price, even when there is free entry into the market. This phenomenon is known as the Diamond paradox. One important question is whether drip pricing, by hiding part of a product's price, will result in the Diamond paradox.

Second, competition complicates the analysis of drip pricing. When firms compete to attract consumers with a low base price, they may pass through some or all of the profits from the high-margin add-ons, reducing or eliminating the harm from drip pricing. Furthermore, under certain conditions, competing firms may be able to attract consumers who do not like drip pricing by

making prices transparent. These issues have been explored in the literature on aftermarket pricing. We need to understand how competition works in drip pricing markets to understand when the practice is harmful and when it is benign.

Finally, consumer learning plays an important role in the ability of a firm to mislead consumers through drip pricing. It is hard for a firm to fool a consumer repeatedly with drip pricing, especially if the product is frequently purchased. When consumers learn that a firm is using drip pricing, they expect the (full) price to be higher than advertised, and this causes them to change their behavior. They might quit shopping from the offending firm, or quit checking suitcases when they fly, or buy lightweight suitcases to avoid the extra charge for heavy suitcases. This affects a firm's ability to profit from deceiving consumers about the price.

These are a few of the issues that were addressed in theory presentations at the Economics of Drip Pricing Conference. The speakers explored the implications of drip pricing with several modeling approaches, including price search, aftermarkets, and behavioral economics models. Presentations on empirical studies of drip pricing provided insights on how firms use drip pricing in particular markets and how consumers respond to it. The markets examined in the conference included air travel, car rental, automobile sales, and computer parts that are sold by Internet vendors through a price search engine. On public policy issues, the conference participants discussed what kinds of interventions could lead to improved consumer decision making, the conditions under which such interventions might be effective, and ideas for empirical studies to evaluate such interventions.

The rest of this segment summarizes the theoretical and empirical studies of drip pricing that were presented at the conference and the discussions of public policy issues by the participants.

3.1 Theories of Drip Pricing

Joe Farrell (FTC) presented two models that explore the economic effects of non-transparent pricing: The first was a vertical aftermarkets-like model in which the firm sets an up-front price that consumers can see and additional charges that are not entirely transparent. When transparency is limited, the firm increases its revenue from the additional charges. This makes

the firm want to sell more of the product and causes the firm to pass through some of the add-on revenue to consumers. However, the lack of transparency causes consumers to be wary of the firm's pricing policy, and this reduces demand for the product. Farrell showed that transparency and pass-through act as substitutes in reducing consumer harm, and that a firm will only adopt drip pricing if the gain in revenue exceeds the reduction in demand from consumer wariness.

The second model was a horizontal analysis in which the lack of transparency prevents consumers from seeing the entire difference in firms' add-on prices. Farrell said that consumers' beliefs about the add-on prices will affect the results of the model. If the lack of transparency makes consumers wary of a price discount offered by a firm, then the elasticity of demand will fall, reducing the incentive for the firm to cut price. Consumers' expectations about add-on prices will affect the ability of a genuine price-cutting firm to attract consumers and the ability of a firm to offer a worse deal by making prices less transparent.

David Laibson (Harvard) presented a behavioral economics model that considers how models of rational behavior are affected when some consumers do not anticipate hidden, or shrouded, prices (Gabaix and Laibson, 2006). His model shows that competition cannot always prevent harm from shrouded prices. In the model there are two types of consumers: sophisticated and myopic. Sophisticated consumers expect add-on prices to be high and avoid the additional charges by finding a substitute for the add-ons. Myopic consumers do not anticipate the add-on price and end up buying the product with the add-on. Firms are competitive and pass through all of the profits from the high-priced add-ons by lowering the price of the base product. Since all consumers purchase the base product, but only the myopes buy the add-ons, the myopes end up subsidizing the purchases of the sophisticates.

If a firm tries to educate the myopes and win their business by offering a transparent, efficient price, the myopes will realize that they would be better off shopping from a firm that shrouds the add-on price because this would give them a subsidy from the remaining myopes. Therefore firms cannot attract business by educating myopic consumers and offering transparent pricing. Laibson concluded that there are regressive welfare consequences of shrouding because the welfare losses are likely to be borne by consumers with low levels of economic literacy.

Michael Baye (Indiana University) considered what three classes of "off-the-shelf" theory models -- search, clearinghouse, and cheap talk/persuasion -- say about drip pricing. It may be tempting to assume that drip pricing raises search costs, and therefore increases price dispersion and/or prices. However, this logic could be wrong because equilibrium effects often differ from partial equilibrium effects that are derived from examining behavior of only one side of the market. It is necessary to use a more complete equilibrium approach because drip pricing can affect the incentives of consumers, retailers, and platforms. Baye finds that drip pricing may be benign, beneficial, or harmful, depending on the environment.

Baye pointed out that drip pricing does not increase equilibrium prices in the Reinganum (1979) sequential search model because a firm does not have an incentive to "hold up" a consumer when the consumer visits its store. Therefore, drip pricing does not lead to the Diamond paradox. In contrast, drip pricing could increase search costs in a clearinghouse environment because any consumer who uses a clearinghouse to obtain price information would then have to conduct costly sequential price search. However, the shrouded equilibrium might not be stable because an individual firm that advertises through a clearinghouse may have an incentive to reveal the shrouded component of the price to attract customers. Furthermore, the clearinghouse would try to induce the firms to make their prices transparent because this would make the clearinghouse more valuable to consumers.

Baye also examined cheap talk/persuasion models in which a retailer advertises a cheap product and then recommends a higher-priced, higher-margin product once the consumer visits the website. The retailer has an incentive to push the product with the higher margin, but also has a countervailing incentive to push the cheaper product because this increases the probability of making a sale. The net effect on consumer welfare is ambiguous.

Michael Waldman (Cornell University) explored the implications of aftermarket pricing models for drip pricing. Drip pricing and aftermarket pricing are similar because, with both, consumers face additional charges after committing to purchase or showing intent to purchase goods or services. The most relevant aftermarket theories to evaluate lack of transparency are those that involve consumer lock-in, in which the firm increases the aftermarket price to consumers who

have high switching costs. This shifts rents from consumers to the firm and may cause inefficiencies in consumption. While pass-through can eliminate the rent shifting, some inefficiencies may remain if too many consumers buy the primary product because of its low price. Reputation and repeated interaction can prevent firms from exploiting consumers (Shapiro, 1995). Another explanation for aftermarket pricing/drip pricing is price discrimination, where the price of the aftermarket good (or the drip price) can be used to extract more rents from consumers with higher willingness to pay.

Waldman laid out several scenarios that vary with whether the additional charge is mandatory or optional, whether the drip revenue is received by the seller, and whether the buyer expects optional add-ons to be included in the base price. In scenarios where the drip pricing revenue is received by the seller, harm from drip pricing will be curtailed if there is competition for the base good, if the good is frequently purchased, or if consumers are sophisticated. If none of these conditions hold and the additional price is large, drip pricing can shift rents from consumers to producers and possibly lead to inefficiencies in consumption. If the seller does not receive the drip pricing revenue (for example, if the add-on price is a tax), repeat purchases or sophisticated consumers will largely prevent harm. Also, although there is no price response under competition in this case, there won't be rent shifting under competition because competitive firms earn zero economic profits. In the final scenario, in which consumers expect to pay a price for an add-on, drip pricing may be used to price discriminate. In this scenario drip pricing may result in rent shifting and inefficiencies in consumption of the base good if the seller raises the add-on price to an inefficient level that is higher than what the consumer expected.

To summarize, a variety of theoretical models can be used to analyze drip pricing. Aftermarket models show that pass-though, competition, repeat purchases, and consumer sophistication can reduce the harm from drip pricing. However, under certain circumstances, competition cannot eliminate harm from drip pricing if some consumers are myopic. Models of information acquisition suggest that drip pricing may be benign, beneficial, or harmful, depending on the environment.

3.2 Empirical Analysis of Drip Pricing

Vicki Morwitz (New York University) described two experimental studies that she conducted with Shelle Santana to investigate how consumers react to drip and partitioned pricing in rental cars and air travel. In the air travel experiment, subjects chose between Spirit and Delta airlines for a hypothetical weekend trip. Delta's advertised fares included mandatory fees as well as fees for some features that were optional on Spirit, such as bringing a carry-on and reserving a seat. The scenarios varied according to the treatment of Spirit airlines: whether mandatory fees were included in the advertised fare and whether fees for options were provided before or after the airline choice. In the rental car experiment, the subjects decided whether to rent a car from Enterprise or take a free shuttle from the airport to the hotel. The scenarios varied according to whether mandatory fees were included in the advertised rental rate and whether fees for options were provided before or after the choice decision.

The results indicate that drip pricing (withholding the fee schedule for options) increased demand and that the effect was greater when mandatory fees were not included in the advertised price. When mandatory and optional fees were disclosed before the choice decision, subjects were more likely to buy optional add-ons and had higher repeat purchase intentions. In the airline experiment, subjects with recent air travel experience were less sensitive to drip pricing, but experience was not a factor in the rental car results. In both experiments, not disclosing all fees was considered deceptive by the subjects.

Meghan Busse (Northwestern University) presented an empirical study of the multi-component negotiations that occur in automobile sales (Busse and Silva-Risso, 2010). The total price of the car, including financing, is determined through a multi-component negotiation in which the prices of the components are negotiated in succession. Multi-component negotiations are a form of drip pricing because consumers negotiate one component of the transaction (say, the trade-in) after the price of another component has already been negotiated (say, the price of the car being purchased). The study tests two alternative theories about multi-component negotiations. The "one discriminatory rent" theory posits that the dealer expects to extract a certain amount of profit from the buyer and will trade off one margin with another to achieve this total profit. This

theory predicts that the margins on the different components of the negotiation will be negatively correlated. Alternatively, the "double jeopardy" theory posits that some buyers are better at negotiating than others, and that negotiating ability will be reflected in the margins of each of the components. This hypothesis predicts that the margins on the different components will be positively correlated.

Using a matched sample, the study computed the correlation between the car margins and, respectively, trade-in margins and financing margins. The results show that the car margins are negatively correlated with trade-in margins, but are positively correlated with financing margins. The negative correlation between car margins and trade-in margins is consistent with the pass-through that can occur with drip pricing. Under this interpretation, the dealer figures out when it is important for a buyer to get a good deal on one component of the transaction, and negotiates a larger margin on other components to make up for it. The positive correlation between the financing margin and car margin could mean that buyers who are poor negotiators do not know they can negotiate financing, but buyers who are good negotiators obtain outside offers for credit before starting the negotiation with the dealer. It could also mean that the consumers who are poor negotiators are less likely to negotiate later in the transaction.

Sara Ellison (Massachusetts Institute of Technology) described research that explored how add-on pricing strategies affect demand and competition (Ellison and Ellison, 2009). The study was based on an Internet market – memory modules – in which firms advertised through a specific price search engine: Pricewatch. Price search engines provide a cheap and easy way for consumers to learn the prices of competing products. Typically a firm that advertises through a price search engine will list the price of its lowest-quality, lowest-priced product and then offer upgrades to consumers who click through to the firm's website. The study classified the product offerings into low, medium, and high quality depending on the add-on features that were sold with the product.

The results showed that the low-quality products had own price elasticities of demand ranging from -33.1 to -17.4 and accounted for a large percentage of the total quantity sold.[22] This shows that the low search costs from using a price search engine can result in aggressive price competition. Another important result is that charging a low price for the low-quality product increased the demand for the higher-quality products. This shows that advertising a low base price attracts customers who then switch up to a more expensive, higher margin product. This form of drip pricing is effectively a bait-and-switch strategy. Ellison concluded by saying that the Internet facilitates price search, but can also facilitate sales strategies that frustrate price search, like add-on pricing.

Amelia Fletcher (OFT), in her keynote presentation, discussed an experimental study of drip pricing that was conducted by Steffan Huck and Brian Wallace (Huck and Wallace, 2010) for the OFT's (2010) report: *Advertising of Prices*. The study compares subjects' shopping behavior in a drip pricing scenario and a baseline scenario. In the baseline treatment, the firm reveals the total price as soon as a subject enters the virtual store. In the drip pricing treatment, the subject sees only the base price upon entering the store and learns about two separate drips (mandatory postage and shipping fees) after the purchase transaction is underway. In each treatment, the subject has two stores to choose from and incurs a cost of visiting a store. The results show that when confronted with drip pricing, subjects are more likely to engage in too little search than under the baseline treatment.

The results can be explained by the behavioral constructs of anchoring, the endowment effect, and loss aversion. Consumers may anchor, or focus, on the base price and adjust incompletely when the additional charges are revealed. The endowment effect can cause consumers to feel as if they own the good as soon as they initiate the buying transaction. At this point, the prospect of not buying it is perceived as a loss, and loss aversion could induce the consumer to go through with the purchase, even if he would not have purchased it had he known the total price up front.

[22] For the 128MB PC100 module, the low-quality product accounted for about 75 percent of total quantity sold (Table 1).

Loss aversion is the tendency to experience a larger reduction in utility from a given loss than the increase in utility from a gain of the same magnitude. The results are also consistent with consumers' systematically underestimating the total price when prices are partitioned.

To summarize, the empirical studies presented at the conference show that drip pricing affects consumers' purchasing decisions. Morwitz found that drip pricing increases demand, but lowers repeat purchase intentions. Fletcher described how drip pricing can cause consumers to stop searching too soon and pay more for products. Busse shows that in multi-component negotiations for new automobiles, the automobile dealers behave as if they are trading off the margin on the new car with the margin on the buyer's trade-in, which is analogous to pass-through. Ellison showed that many people benefit from the heavy discounting by firms that advertise through a price search engine, but that some consumers who were attracted by the low advertised prices switched to higher-margin products.

3.3 Public Policy and Drip Pricing

The participants discussed issues that are important to regulators in formulating policy towards drip pricing. The practice is pervasive, and regulators need guidance on where to focus their resources and what sorts of actions would induce firms to make prices more transparent and improve consumer decision making.

The participants were hesitant to recommend a broad effort to regulate drip pricing because the practice is used in many industries, making it unlikely that a single policy would be optimal for all markets. They listed a number of targeting criteria for policy makers to consider in deciding where to focus their efforts: Factors that might increase the benefit of enforcement include large market size, perceived product importance, lack of buyer sophistication, lack of repeat purchase, low level of market competition, high profit margins, the extent to which consumers are surprised, the difficulty of finding the add-on prices, and the difficulty of canceling a transaction when the additional charges are revealed.

David Laibson and Jonathan Zinman suggested that researchers conduct empirical studies to understand when consumers are misled about drip pricing and how various disclosures and

interventions would affect the use of drip pricing and consumer harm from it. Laibson recommended conducting many small-scale studies, market by market, to develop a body of empirical knowledge and implementing on a wider scale the pilot studies that proved effective. Zinman advanced the idea that empirical analyses could be used to identify actions that could destabilize shrouded equilibria, such as consumer education or reducing switching costs.

Some participants raised concerns about this empirical approach to understanding and regulating drip pricing. Michael Waldman said it would be more practical to rely on theory to guide policy because the practice is so common that one would have to study thousands of markets. Michael Baye argued that drip pricing disclosures would make firms less nimble in their response to changes in the business environment and lead to stickiness in prices. This would be particularly problematic in stores that sell thousands of products or in situations where different customers face different add-on prices. In addition, mandating more complex or complete up-front disclosure of prices may confuse consumers rather than foster competition, as was the case with federal mortgage disclosures (Lacko and Pappalardo, 2007). Baye added that voluntary disclosure may mitigate the harm and inefficiencies from drip pricing. For example, firms on the Internet have come up with better ways to provide information to consumers, such as price comparison sites that display shipping charges and taxes along with the product price.

Several participants advised policy makers to be cautious in their approach to a la carte pricing. Florian Zettelmeyer noted that in some industries the ability to configure products is an enormous benefit. Forcing manufacturers to offer fewer option packages would reduce the choices that are available to consumers. If policy makers start regulating product offerings and how prices are advertised, firms will devise ways to get around the regulations. Increases in flexible manufacturing are only going to increase the options that manufacturers offer and this will raise the complexity of pricing. Michael Waldman cautioned that it would be complicated and confusing to reveal so many add-on prices to consumers. Sara Ellison argued that it would be difficult even to articulate a policy of transparency for add-on pricing. Would a pizza restaurant be required to announce that the average customer buys pepperoni and mushroom and use that as the basis of the quoted price? However, Vicki Morwitz pointed out that if a very large

percentage of customers – say, 95 percent – purchase a product feature, there is a question about whether the feature is really optional.

Michael Salinger advised policy makers to focus on situations when drip pricing is deceptive and avoid pursuing situations in which price discrimination is the motive for drip pricing. Michael Baye pointed out that price discrimination through drip pricing helps high fixed cost companies like airlines cover their average variable costs. Sara Ellison said that the use of add-on pricing on the Internet provides a way for firms to escape the extremely high price elasticities that have accompanied the large reductions in the cost of search on the Internet. However, David Laibson, while not objecting to price discrimination generally, argued that consumers with low financial literacy, low education, and low income tend to be disproportionately harmed by drip pricing.

Michael Salinger raised the question of whether the regulation of drip pricing could facilitate collusion. Some multidimensional products and services are complex, and it is hard for consumers to compare the pricing of competing alternatives. Requiring companies to price their products and services in a way that makes them easily comparable to consumers could also make it easier for companies to collude on price.

Vicki Morwitz and Rebecca Hamilton discussed partitioned pricing and how it differs from drip pricing. Morwitz said that with partitioned pricing, there can be full disclosure of the components of a price, but the firm does not list the total price of the product. However, even when all the components of the price are disclosed, consumers tend to underestimate the price in certain situations and can make mistakes. For example, they might assume that mandatory surcharges are the same across competitors – even when they are not – and just compare the base prices. Hamilton added that partitioned pricing studies found that consumers are differentially price sensitive to the various components of the price and are more sensitive to shipping charges than the price of the product. Partitioned pricing can even make consumers feel better off by increasing the salience of a product feature that provides a large benefit.

The conference advanced our understanding of drip pricing, yet we did not find definitive answers to the questions that motivated the conference. Firms use drip pricing for a variety of

reasons, and the practice can be harmful, benign, or efficient. Importantly, the participants identified a number of factors that influence the potential harm from drip pricing and therefore serve as targeting criteria for regulations and enforcement actions. One key recommendation is to conduct empirical studies to identify disclosures that will reduce harm from drip pricing and interventions that can induce firms to use transparent pricing.

4 Conclusion

Evaluating the likely effects of mergers is one of the primary functions of the FTC. Our work on mergers in the pharmaceutical area this year has been more interesting than most. One merger, in the PBM industry that might have appeared to be anticompetitive was found, upon closer examination, to pose fewer problems than we thought. A pharmaceutical merger raised interesting factual and analytical questions regarding possibilities for therapeutic substitution by physicians and hospitals. On the consumer protection front, our examination of drip pricing might allow us to gauge better the circumstances under which that pricing practice could have deleterious effects for consumers and allow better focused enforcement against deception and unfair practices.

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